

20263

TECHNICAL REVIEW OF MEMORANDA FOR THE
STANDLEY LAKE PROTECTION PROJECT

ROCKY FLATS PLANT
JEFFERSON COUNTY, COLORADO

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY
Region 8 Federal Facilities Remedial Branch
Denver, Colorado

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1.0 INTRODUCTION

PRC Environmental Management, Inc. (PRC) prepared this report for the U.S. Environmental Protection Agency (EPA) under contract number 68-W9-0009 (Technical Enforcement Support (TES) 12), work assignment number C08056. This report documents PRC's findings upon review of the field activities, risk assessment (RA) assumptions and air modeling protocol memoranda. These RA and air modeling memoranda actually consisted of four separate memoranda. These memoranda are the construction-related information dated January 8, 1993; Fugitive Dust Modeling Protocols dated January 16, 1993; Fugitive Dust Modeling Analysis, dated January 16, 1993; and the RA protocols dated January 16, 1993. PRC reviewed all five of these memoranda. PRC also reviewed the cities' decision to use meteorological data from Stapleton Airport rather than the Arvada or the Rocky Flats Plant (RFP) data. Both general and specific technical review comments have been generated from this review. For clarity, the comments have been subdivided by the memoranda title below. In addition, PRC has provided a summary which provides an overall picture of the inconsistencies and problems noted in the various memoranda.

2.0 FIELD ACTIVITIES REPORT

GENERAL COMMENTS

1. PRC compared the field activities report to the June 24, 1992 field sampling plan. The differences and similarities between these two documents are illustrated in Table 1. PRC noted that the surface soil samples and the sediment samples were not collected as proposed. Specifically, more than the upper 6 inches of soil was collected from the soil borings, and five of the six sediment sampling locations did not collect samples across the channel. As shown on Table 1, a composite soil sample was prepared by taking the top soil portion of at least three separate advances of the auger (drive) into the upper 2 feet of soil at each location. More than 6 inches of soil, however, was often collected from each drive. By collecting more than 6 inches of surficial soil, the contaminant concentration can be diluted and the resulting concentrations may not be an accurate representation of the contamination present in the surficial soil. Collecting sediment along the channel rather than across the channel does

not present an accurate picture of the sediments in the stream. These two sampling efforts must be re-done before the data will be acceptable for a quantitative RA.

3.0 CONSTRUCTION-RELATED INFORMATION

GENERAL COMMENTS

1. This memorandum does not state whether the calculated concentration estimated dust generation figures include dust suppression factors. This information should be clearly stated in the report.
2. Only one of the sources of information listed in this memoranda are provided. All the applicable reference material and sources should be listed. Until this information is provided, it is difficult to review and verify the conclusions reached in the memoranda. Upon receipt of additional information, PRC will be able to conduct a more thorough review of the memoranda.

4.0 FUGITIVE DUST MODELING PROTOCOLS

GENERAL COMMENT

1. A memorandum from Mark Schaaf dated June 8, 1992 is referenced several times in the assembled documents. However, this June 8, 1992 memorandum is not, but should be included in the packet of documents.

5.0 FUGITIVE DUST MODELING ANALYSIS

5.1 GENERAL COMMENTS

1. The memoranda references several reports that will be submitted at a later date. Because these reports will contain the details of the fugitive dust model, these reports should be submitted for agency review. Submittal of these reports should be closely monitored.

5.2 SPECIFIC COMMENTS

1. Page 4, Paragraph 1. The text states, "...the air concentrations and surface deposition rates will be evaluated at 10 to 20 sensitive offsite receptors." The location of these proposed sensitive off-site receptors or the criteria used to select them should be clearly stated. Receptor location is a critical parameter for modeled results and should be evaluated.

6.0 RISK ASSESSMENT PROTOCOLS

6.1 GENERAL COMMENTS

1. The Standley Lake Diversion Project is a Superfund site and the risk assessment must be conducted according to Comprehensive Environmental Response and Compensation Liability Act (CERCLA) regulations and EPA guidelines. RA guidelines can be found in Risk Assessment Guidance for Superfund (RAGS), Volume I, Part A.
2. It is not clear whether dust control measures will be taken into account when modeling dust concentrations in air. Dust control measures should not be considered in determining these concentrations or in risk assessment calculations because it represents institutional controls that cannot be verified.
3. Soil and sediment samples should be collected from areas that will be disturbed by construction activities, including the construction and use of haul roads. Soil from these areas will be disturbed and will contribute significantly to fugitive dust. It is not clear from this memorandum whether these areas were included in the sampling conducted in August and September 1992. For clarity, the memoranda should provide a map of sampling locations.
4. The text states that "soil in the proposed construction area may potentially be contaminated with radionuclides, heavy metals and pesticides." No mention is made of potential contamination by organic chemicals. The reasons for this assumption should be explained.

5. The method for calculating dust concentrations in air should be clarified. It is not clear that the modeled concentrations will represent the worst-case scenario regarding dust generating activities.

6.2 SPECIFIC COMMENTS

1. Page 1, First Paragraph. The text states, "The SLDP risk assessment is concerned with incremental risks associated with construction activities. That is, it is not an objective of the SLDP risk assessment to determine the risks due to the existing background conditions." These statements are unclear. First, background chemicals are only represented by inorganic compounds. If organic compounds are detected in "background samples", this indicates the background area has been affected by man and therefore cannot represent background. Also, background risks should not be subtracted from estimated risk for a particular chemical. These points should be clarified.
2. Page 2, Second Paragraph. The text states that an ecological risk assessment will not be conducted. This is not acceptable. An ecological risk assessment for Superfund sites must be conducted under CERCLA regulations.
3. Page 2, Second Paragraph. The text states that naturally occurring radionuclides and slightly elevated concentrations of some man-made radionuclides may contribute to background risk. If soil disturbing activities cause these radionuclides to become airborne or contribute otherwise to the overall risk in any other way, then they should be addressed in the risk assessment. Excluding these contaminants from consideration may result in an underestimation of risk.
4. Page 3, Second Paragraph. The text states that radiological validation protocols based on method-specific criteria and normal industry practices will be used as guidance for data evaluation. Normal industry practices should be described in greater detail and references should be provided. RA conducted according to RAGS should be based on validated data provided by a contract laboratory program (CLP) certified laboratory.

5. Page 5, Last Paragraph. This paragraph states that airborne contaminant concentrations resulting from dust generation and by topsoil will be determined for each receptor location by assuming that the dust consists of surface soil (or sediment if appropriate) with the same contaminant concentrations as the closest surface soil composite or sediment sample. However, neither this memoranda nor the two fugitive dust memoranda describe how the results of the fugitive dust model (FDM) and the sampling data will be combined to determine the contaminant concentration of particles released to the air during construction. The equations used to calculate these variables must be provided. As currently written it appears that the FDM and the RA are two separate efforts.
6. Page 7, Fourth Paragraph and Page 8, First Paragraph. Both of these paragraphs describe the process of calculating human health risk to construction workers and residents, by using appropriate data collected from surface soils, soil borings, or sediments. Specifically, the data from the sample location closest to each receptor will be used. The use of one media to calculate risk may not be appropriate. Instead, all appropriate media should be included in the risk assessment for each receptor and risks should be summed if several media are contributing to risk. In addition, direct exposure to soil will not be assessed for residences, according to the text. Trespassers and children playing in the construction area could be directly exposed via incidental ingestion. Given that the construction area is very near residences, the possibility of direct exposure by a child should be addressed.
7. Page 7, Fifth Paragraph. The hot spot evaluation described in this paragraph and on page 8 is not protective of residents and may underestimate exposure for construction workers. The current proposal is to use a hot spot evaluation to determine risk to construction workers. Risks to residents will not be calculated using the hot spot evaluation. However, some residences are very close to construction areas, and receptors are likely to be exposed to hot spots found in the construction areas. Wind deposition of soil from the hot spots could expose residents to contaminants in concentrations higher than would be estimated by other soil samples. In addition, both construction workers and residents could be exposed to these concentrations for more than 1 week (the proposed time frame). Additionally, the text implies that all hot spots will be found only in construction areas. It is possible that a hot

spot will be located on a haul road and will be disturbed frequently. This possibility should be addressed.

8. Page 8, First Paragraph. The text states that a range of risk results for residential locations around the canal construction area will be provided. It does not describe how risks for residences surrounding the haul roads will be calculated or assessed. Residences near the haul roads will be affected by dust from the haul roads and soil being transported in the trucks. Risks for these residences should be addressed.
9. Page 8, Second Paragraph. The intent of this paragraph is should be clarified, particularly regarding the significant deposition of contaminants. The paragraph states that "deposition will be considered significant if it results in average surface soil concentrations that are 20% higher than current average contaminant concentrations in surface soils in the area". As soil samples are not being collected from residences, it will not be possible to determine if a 20-percent increase in contaminant concentration has occurred. Additionally, the use of 20 percent as a cut-off appears to be arbitrary and should be explained. Quantitative evaluation of the risk should be calculated for all residential receptors based on modeled concentrations. The use of a non-EPA-approved benchmark level is not acceptable.
10. Page 10, Table 1. Using the annual average concentration for reasonable maximum exposure (RME) calculations is inappropriate. Annual average concentrations will be lower than some hourly concentrations and will not reflect upper-bound risks. It is also not clear which soil concentrations will be used to calculate the airborne contaminant concentrations. The upper 95-percent confidence limit or maximum contaminant concentrations and dust concentrations should be used. Similarly, it is unclear how a hot spot can be evaluated using an annual average concentration. Hot spots are localized areas with high concentrations of contaminants. Again, upper 95-percent confidence limit or maximum contaminant and dust values should be used. Overall, the calculation of annual average concentrations should be described in detail.

7.0 METEOROLOGICAL STATION DETERMINATION

Lastly, PRC was asked to comment on CH₂M Hill's decision to not use either the Arvada or RFP meteorological data. The rationale for this decision was stated in the cities transmittal letter and supporting memoranda dated January 8, and January 16, 1993. Comments on the letter and memoranda appear in the following paragraph and specific comments.

The January 8, 1993 memorandum states, "The RFP tower data appeared to be more realistic; however, these data are from a height of 60 meters instead of 10 meters preferred for the Fugitive Dust Model. Additionally, certain essential parameters for the model could not be calculated from the RFP data. Based on these potential issues, we have decided not to use the meteorological data from either Arvada or the RFP stations. As an alternative, data from Stapleton Airport appeared to be more suitable for use in the model." Even if the data from Stapleton Airport are collected at the appropriate height of 10 meters, it still may be less representative than data taken at RFP at a height of 60 meters. Rationale should be provided because the decision regarding whether 60-meter, on-site data or 10-meter off-site data is so subjective. In addition, a written statement from Kevin Briggs (CDH) outlining why he agrees with this decision should be included. After reviewing the rationale for this decision, PRC will be in a better position to assess the technical merit of the decision. Also, the memorandum should clearly state which "essential parameters" are not monitored at the Rocky Flats meteorological tower.

January 16, 1993 Memorandum from Lawrence Nicholl

1. Pages 1 and 2. The text states, "In a similar sense, it will be necessary to analyze emission and dispersion of Total Suspended Particulates (TSP) separately from the 10 μm and smaller fraction (PM_{10}). This is because although TSP will contribute to total particulate deposition and thus the external exposure pathway. Only PM_{10} can contribute to the inhalation pathway in the human health risk assessment." Although it is true that particles greater than 10 μm in diameter are effectively filtered out by the upper respiratory tract, the eventual fate of these particles may be ingestion. Thus, health risk from ingestion should also be considered as the larger particle size can be swallowed.

2. Page 2. The text states, "It has also been judged more appropriate to base the dispersion analysis upon a single annual average concentration for each receptor location, instead of the hourly analysis proposed earlier." An hourly analysis should also be conducted to estimate acute health risk.
3. Pages 3 and 4. For clarity, the emission factor equations should be individually referenced. Specifically, the sources for all equations should be provided.

8.0 SUMMARY

A review of the five memoranda revealed several technical inadequacies. First, the proposed RA is not being conducted according to CERCLA guidance. This guidance must be followed as the construction activities are being conducted on a Superfund site. Second, how the FDM information will be incorporated into the RA has not be addressed. Lastly, the improper data collection during the sampling activities means that the current data could not be used in the FDM or RA. Therefore, it is impossible to proceed with a RA until these issues are addressed.

TABLE 1

DIVERSION ALIGNMENT SAMPLING

PROPOSED FIELD WORK		ACTUAL FIELD WORK	
SURFACE SOIL SAMPLING			
Collect six surface soil samples. Each will be a 10 acre plot.			
1	Coincide with northern half of Woman Creek reservoir dam	1	Utilized a 10-acre rectangle
2	Coincide with southern half of Woman Creek reservoir dam	2	Utilized a 10-acre rectangle
3	Along canal alignment west of Alkire Street	3	Modified shape of rectangle to correspond to bend in alignment
4	Along canal alignment between Alkire and Simms streets	4	Utilized a 10-acre rectangle
5	Near where canal will transition to concrete spillway	5	Modified shape of rectangle to correspond to bend in alignment
6	Coincide with downstream energy dissipation pond	6	Utilized a 10-acre square
Collect samples by the CDH surficial soil method		Samples were collected by CDH method	
Analysis: Pu, Am, U and TAL metals		Did analysis for radionuclides and TAL metals	
SEDIMENT SAMPLING			
Subdivide upstream portion of Woman Creek into four lengths. Locate a transect along the center of each segment length. Each cross channel transect should be less than 10 feet. Collect three to six samples along each transect. Samples will be collected to the depth of sediment (as seen by resistance to sampling tool). Several subsamples will be composited into one sample at each location		<p>The field logbook provided the only information on sediment sampling. Transects were not installed cross channel. Instead they were parallel to the steam bank. The depth of transect was not specified. A Ponar dredge could not be used because of hard sediments and a hand auger was used instead. Only one location (SD-2) was set up across channel.</p> <p>SD-1(11A) - three subsamples and rinsate and duplicate SD-2(11A) - five subsamples SD-3(11A) - three subsamples - no drawing provided in field logbook SD-4(11A) hand auger - four subsamples - no drawing provided in field logbook</p>	
Analysis: Pu, Am, U and TAL metals, atrazine and simazine		Analysis: Radionuclides, metals, simazine and atrazine	